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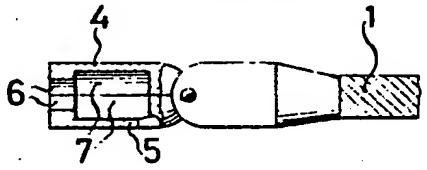
(54) **Forceps for grasping and applying a fallopian tube plug and a plug**

(57) Two jaws 4, 5 have their free ends angled towards one another through a right angle to define, in the closed position, a passage 6 opening out to form a chamber 7, of enlarged cross-section, the passage fitting around a neck 9 on the plug.

A fallopian tube plug comprises a cylindrical shaft 12, of plastics material which is provided on its circumference with a plurality of axially spaced and annular skirts 13 and a skirt-free neck 9 by which the plug is grasped by the forceps.

FIG. 2



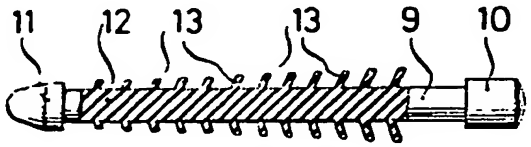


FIG. 6

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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FIG.6

FIG.1

FIG.4

FIG.3

FIG.5

FIG.2

SPECIFICATION

Improvements in or relating to flexible surgical forceps

The present invention relates to flexible surgical forceps for grasping and applying fallopian tube plugs said plugs being of the kind having a neck at the proximal end which may be followed by a head-like part of enlarged cross-section.

For the reversible sealing off of the fallopian tubes, use is made in practice of plug devices of various shapes and dimensions which are inserted through the operating passage of a hysteroscope and into the two fallopian tubes through their ostia from inside the uterus by means of a flexible forceps or a holder; the object of inserting these plugs being to prevent conception from taking place. The plug devices which are used generally terminate at the proximal end in a thin neck of circular or polygonal cross-section which is followed in some cases by a head-like part of enlarged cross-section.

It is an object of the invention to enable fallopian tube plugs of the kind referred to be grasped securely, held and introduced into the fallopian tubes by their proximal neck, which is generally in the form of a slender cylinder, using flexible forceps which can be passed through the operating passage of a hysteroscope.

Accordingly, the invention consists in flexible surgical forceps for grasping and applying fallopian tube plugs having a neck at the proximal end which may be followed by a head-like part of enlarged cross-section, wherein said forceps comprises a proximal handle operatively connected to move two jaws the free ends of which are angled towards one another through a right angle and which, in the closed position of the forceps, form between them a passage to receive and fit around a neck on said plug, said passage opening out proximally to form a chamber of enlarged cross-section between said jaws.

The invention also consists in a fallopian tube plug for use with the forceps according to the invention, said plug comprising a substantially cylindrical shaft of plastics material which is provided on its circumference at points rearwardly of its rounded distal end, with a plurality of axially spaced and proximally angled annular skirts, said shaft between the last said skirt at the proximal end and an enlarged part of the shaft, having a slender skirt-free neck of the same diameter as that of the cylindrical shaft, to be graspable by the free ends of the jaws of the forceps.

By these means according to the invention it is possible for a fallopian tube plug to be grasped securely by its neck and to be held and applied by fitting into the passage or channel in the right-angled ends of the jaws. At the same time the space of enlarged cross-section between the jaws which follows on from the passage or channel can without difficulty accommodate head-like enlargements of the plug which may exist at the proximal end of the neck, in particular ones belonging to plugs which are in addition provided with annular skirts inclined towards the proximal end, thus providing additional insurance against the plug escaping from the jaws of the forceps.

In order that the invention may be more clearly understood, reference will now be made to the accompanying drawings, showing some embodiments thereof by way of example and in which:–

Figure 1 is a side view of flexible surgical forceps as they are introduced into the uterus and carrying a fallopian tube plug of generalised configuration, the hysteroscope generally employed for this purpose not being shown, a plug being shown already inserted in the right hand fallopian tube,

Figure 2 is an enlarged scale side-view of the distal end of the forceps with the jaws shown partly in section,

Figures 3 and *4* are two end-on views of closed forceps jaws having passages of different cross-section, looking in direction X.

Figure 5 is a side view of a fallopian tube plug of generalised configuration, and

Figure 6 is a side view of a specific kind of fallopian tube plug which is used.

Referring to the drawings, an illustrative embodiment of forceps according to the invention comprise a flexible guide sleeve 1 having a flexible traction cable 2 passing through it which cable can be operated by means of a proximal handle 3 to open and close the two movable jaws 4 and 5 of the forceps.

The jaws 4 and 5 are angled towards one another at a right angle at their free ends and in the closed position form between them a passage 6 or channel of round (Figure 3) or square-cornered (Figure 4) cross-section which passage opens out proximally to form a chamber 7 of enlarged cross-section between the jaws.

A flexible forceps of this kind is capable of grasping and applying not only conventional fallopian tube plugs 8, e.g. as shown in Figure 5 but also particular specialised plugs according to the invention as shown in Figure 6, while holding them securely, since the proximal neck 9, which is in the form of a slender cylinder for example, fitting as it does into the passage 6 between the free ends of the jaws 4, 5 of the forceps, is securely grasped and is firmly held when being applied, the chamber 7 of enlarged cross-section between the jaws 4, 5 then accommodating the head-like part 10 of the plug which is of larger diameter, thus providing an additional assurance that the plug 8 cannot escape from the jaws.

The specific fallopian tube plug which is used, as illustrated in Figure 6, is provided, on the circumference of its substantially cylindrical shaft 12, at points rearwardly from its rounded distal head 11 with a plurality of axially spaced annular skirts 13 which are inclined slightly in the proximal direction and whose diameter increases progressively from the distal to the proximal ends, of the shaft 12, and at the proximal end it has a head 10 whose diameter is greater than that of the shaft 12 and between which and the skirts 13 there is a part 9 like the part 9 in Figure 5, which is free of skirts and which can be securely grasped, as is explained above, by the

ends of the jaws 4, 5, which are angled inwards towards one another at a right angle and which form the passage 6.

CLAIMS

1. Flexible surgical forceps for grasping and applying fallopian tube plugs having a neck at the proximal end which may be followed by a head-like part of enlarged cross-section, wherein the forceps comprise a proximal handle operatively connected to move two jaws, the free ends of which are angled towards one another through a right angle and which, in the closed position of the forceps, form between them a passage to receive and fit around a neck on a plug, the passage opening out proximally to form a chamber of enlarged cross-section between the jaws.

2. A fallopian tube plug for use with the flexible surgical forceps as claimed in claim 1, which plug comprises a substantially cylindrical shaft of plastics material which is provided on its circumference, at points rearwardly of its rounded distal end, with a plurality of axially-spaced and proximally annular skirts, the shaft, between the last skirt at the proximal end and an enlarged part of the shaft, having a slender, skirt-free neck of the same diameter as that of the cylindrical shaft to be graspable by the free ends of the jaws of the forceps.

3. A fallopian tube plug as claimed in claim 2, wherein the diameter of the annular skirts increases progressively from the distal to the proximal ends of said shaft.

4. Flexible surgical forceps substantially as hereinbefore described with reference to Figures 1, 2 and 3 or Figures 1, 2 and 4 of the accompanying drawings.

5. A fallopian tube plug substantially as hereinbefore described with reference to Figure 6 of the accompanying drawings.

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